# Plastics - Simple heat release test using a conical radiant heater and a thermopile detector (ISO 13927:2023)

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## NATIONAL FOREWORD



| | |
|---|---|
| See Eesti standard EVS-EN ISO 13927:2023 sisaldab Euroopa standardi EN ISO 13927:2023 ingliskeelset teksti. | This Estonian standard EVS-EN ISO 13927:2023 consists of the English text of the European standard EN ISO 13927:2023. |
| Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas | This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation. |
| Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 06.09.2023. | Date of Availability of the European standard is 06.09.2023. |
| Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest. | The standard is available from the Estonian Centre for Standardisation and Accreditation. |

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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English Version

# Plastics - Simple heat release test using a conical radiant heater and a thermopile detector (ISO 13927:2023)

Plastiques - Essai simple pour la détermination du débit calorifique au moyen d'un radiateur conique et d'une sonde à thermopile (ISO 13927:2023)

Kunststoffe - Einfache Prüfung der Wärmefreisetzung unter Anwendung eines kegelförmigen Strahlungsheizkörpers und einer Thermosäule als Detektor (ISO 13927:2023)

This European Standard was approved by CEN on 21 April 2023.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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## European foreword

This document (EN ISO 13927:2023) has been prepared by Technical Committee ISO/TC 61 "Plastics" in collaboration with Technical Committee CEN/TC 249 “Plastics” the secretariat of which is held by SIS.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 2024, and conflicting national standards shall be withdrawn at the latest by March 2024.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 13927:2015.

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## Endorsement notice

The text of ISO 13927:2023 has been approved by CEN as EN ISO 13927:2023 without any modification.

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# Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 4, *Burning behaviour,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 249, *Plastics,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 13927:2015), which has been technically revised.

The main changes are as follows:

— the normative references have been updated to the latest editions (see Clause 2);

— use of mass flow rate of methane gas corresponding to the net heat of combustion for calibration of the thermopile has been added in Clause 9;

— a new Annex D giving an example of thermopile calibration has been added and subsequent annex has been renamed as Annex E.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

# Introduction

Fire is a complex phenomenon; its behaviour and effects depend upon a number of interrelated factors. The behaviour of materials and products depends upon the characteristics of the fire, the method of use of the materials, and the environment in which they are exposed (see also ISO 13943).

A test, such as the one specified in this document, deals only with a simple representation of a particular aspect of the potential fire situation, typified by a radiant heat source, and it cannot alone provide any direct guidance on the behaviour or safety in fire (see ISO/TS 3814). A test of this type can, however, be used for comparative purposes or to ensure the existence of a certain quality of performance (in this case, heat release from a composite material or an assembly) considered to have a bearing on fire performance generally. It would be wrong to attach any other meaning to performance in this test. The attention of all users of this test is drawn to the warning that immediately precedes Clause 10.

# Plastics — Simple heat release test using a conical radiant heater and a thermopile detector



## 1 Scope

This document specifies a method suitable for the production control or product development purposes for assessing the heat release rate of essentially flat products exposed in the horizontal orientation to controlled levels of radiant heating with an external igniter. The heat release rate is determined by the use of a thermopile instead of the more accurate oxygen consumption techniques. The time to ignition and sustained flaming are also measured in this test. The mass loss of the test specimen can also be measured optionally.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 291, *Plastics — Standard atmospheres for conditioning and testing*

ISO 5660-1, *Reaction-to-fire tests — Heat release, smoke production and mass loss rate — Part 1: Heat release rate (cone calorimeter method) and smoke production rate (dynamic measurement)*

ISO 13943, *Fire safety — Vocabulary*

ISO 14697, *Reaction-to-fire tests — Guidance on the choice of substrates for building and transport products*

ISO 14934-3, *Fire tests — Calibration and use of heat flux meters — Part 3: Secondary calibration method*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 13943 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

**3.1**
**flat surface**
surface whose irregularity from a plane does not exceed ±1 mm

**3.2**
**ignition**
onset of *sustained flaming* (3.7)

**3.3**
**material**
single substance or uniformly dispersed mixture, for example, metal, stone, timber, concrete, mineral fibre or polymer